AN OUTLINE OF THE HISTORY OF THE *BOTANICAL DEPARTMENT* OF UNIVERSITY COLLEGE, LONDON

An Outline of the History of the *Botanical Department* of University College, London

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JOHN LINDLEY
1799-1865

DANIEL OLIVER
1830-1916

Plate I

AN OUTLINE OF THE HISTORY OF THE *BOTANICAL DEPARTMENT* OF UNIVERSITY COLLEGE, LONDON

THE Chair of Botany in University College, London, dates from the foundation in 1827. As a University subject, at any rate in England, Botany at that date was at a low ebb, and its inclusion as a college chair probably depended less on the inherent claims of the subject to recognition than on the requirements of the medical curriculum. For, whilst the Linnean period had waned, the active revival of Botany associated with Robert Brown and the Hookers had yet to culminate. Unlike so many of the provincial colleges that were later established, University College never passed through the phase of having a professorship of General Natural History, to be later subdivided into its constituent subjects.

During the first fifty years there existed here no department of Botany in the modern sense. The professor duly delivered his lectures and departed; but for the accident that, here and there, the seed fell on good ground, the progress of the subject was not directly advanced. The professor held his college post primarily as an additional source of income, and there were no practical facilities for developing the science within the precincts. There were few positions of emolument open to a botanist, and of the deliberate training of advanced and post-graduate students there was none.

There have been only three Professors of Botany during the period: John Lindley, 1828-1860; Daniel Oliver, 1860-1888; F. W. Oliver,* 1888-19—. This no doubt is a " record " in the history of this college, but for length of days it is completely eclipsed by Cambridge, where one hundred and sixty-two years

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* F. W. Oliver, though head of the department, was Quain Lecturer 1888-1889, and became Professor in 1890.

(1733-1895) saw only four Professors of Botany, the two Martyns spanning ninety-two years between them (1733-1825).

JOHN LINDLEY (1799-1865), of Yorkshire stock and East Anglian by birth, was the first effective* Professor of Botany in the then University of London, to which chair he was elected in 1828. Educated at Dr. Valpy's School at Norwich, where also William Hooker had previously been a pupil, Lindley's first desire was a commission in the army; this, for financial reasons, became impossible; he, however, at a later date, served in the ranks of the 5th Volunteer Battalion of the Middlesex Regiment.

The first half of the nineteenth century is historically noteworthy in that it saw the raising of the botanical edifice on foundations already laid. Lindley took a prominent part in this work, work which required not only knowledge and understanding of the subject but also administrative ability, foresight and courage. In those days the teaching of Botany was a much less arduous task than at the present time, a fact due to the relatively small amount of botanical knowledge which obtained, and also to the absence of practical classes as we understand them nowadays. Thus Lindley had much time for his investigations, his writings, and for administrative work outside the college. As a teacher, the fact that William Griffith and William Crawford Williamson were amongst his pupils is a sufficient indication of Lindley's quality. His lectures are described as being remarkable for their clearness, conciseness, and profuseness of illustration.

Lindley's audience was not, however, limited to the confines of the Botanical theatre; his *Vegetable Kingdom* still is used as a book of reference, whilst his *Introduction to Botany* was for many years the best of text-books. His smaller books, *School Botany* and the *Ladies Botany* for example, long have lost their vogue; they are, however, desirable possessions if only for their illustrations. He himself regarded his *Theory of Horticulture* as his best work. As a pure botanist, Lindley's name is chiefly associated with taxonomy; he did much to replace the artificial system of Linnaeus by the natural system of plant classification preached by Jussieu, whilst amongst his original contributions to systematic botany, Lindley's work on the Orchidaceæ is outstanding. Lindley also was one of the pioneers in the study of fossil plants, he being associated with Hutton in the *Fossil Flora of Great Britain.* Distinguished though this work be, possibly the greatest service of Lindley to botanists, and indeed to mankind, was the work he did in securing the Royal Gardens, Kew, for scientific purposes. He was chairman of the Parliamentary Committee appointed to consider the problem of the Gardens, and the result of their labours was that Kew Gardens were saved.

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* Effective, in that Sir William Hooker, although actually the first Professor, did not take up the duties, being unwilling to leave Glasgow, where he had filled the Chair of Botany since 1820.

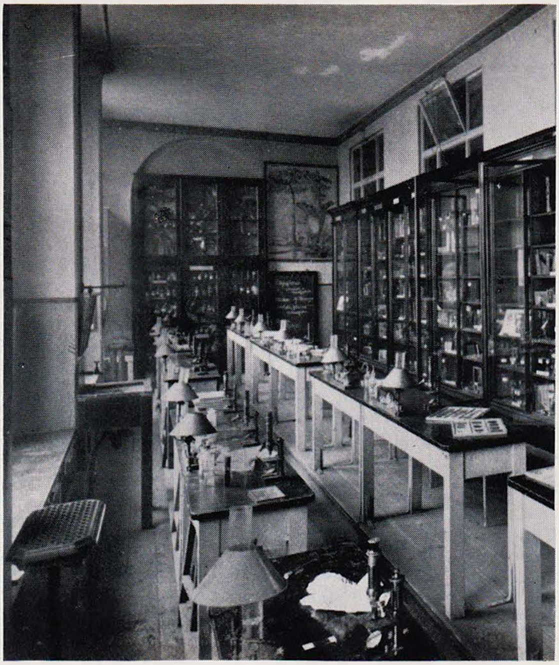
Incidentally, one passage in the Committee's Report—" The wealthiest and most civilised country in Europe offers the only European example of the want of one of the first proofs of wealth and civilisation. . . ."—throws an interesting sidelight on Lindley's character. He was a good Englishman.

At a later date, 1862, Lindley undertook the organisation of the Colonial Department of the 1862 Exhibition, and it is considered that the worry of this work—for, although kind-hearted, he was hot tempered and impatient of opposition—hastened his death.

In addition to his Professorship, Lindley held outside appointments all connected with horticulture. He held responsible positions under the Society of Apothecaries and the Royal Horticultural Society, and he was the first editor of the *Gardener's Chronicle*, but these activities hardly form part of the College history. After thirty-two years service, Lindley resigned his Professorship in 1860, and was succeeded by

DANIEL OLIVER (1830-1916), a Northumbrian who, with a natural love of plants and country, had in the sympathetic environment of the Tyneside Naturalists' Field Club acquired a wide and critical knowledge of the British Flora. Before being attracted to Kew by the Hookers, he had already held a Lectureship in Botany at the local Medical School. He had written in 1858 to Sir Wm. Hooker, then Director of Kew, suggesting that possibly there might be an opening as botanist to a surveying expedition, adding: "I venture to express a hope that thou wilt kindly afford me a chance of placing my best services at thy disposal." The ambition to take part in a far journey was never gratified. The Hookers found Oliver much too useful at Kew to dream of liberating him in that way, and his thirty or more active years as Botanist were passed chained as Keeper to the Herbarium. In revenge, he built up a wonderfully vivid picture of the world's floras, their affinities and distribution, from constant contact with botanists coming and going, and from the handling of numerous collections. The plants of newly-explored countries always attracted him, and the collections made by Speke and Grant on the Nile, Im Thurn in Roraima, and the Chinese plants sent home by Augustine Henry, on which he reported, may be cited as examples. He part wrote and edited the "Flora of Tropical Africa," whilst the "Icones plantarum," during this period, came mainly from his hands. During the thirty years at Kew the "Genera plantarum" of Bentham and Hooker was in progress, and in consultation he contributed much. Fifty years ago Kew was the botanical Mecca, and in the sixties, seventies and eighties of last century the systematists of all lands found their way thither drawn by the incomparable collection of

Plate II



BOTANICAL LABORATORY IN THE CLOISTERS, U.C.L. 1891 plants that took form under Oliver's guidance. In a sense this collection forms his most fitting memorial.

Apart from his botanical activities, Oliver was an accomplished artist in water colours and in black and white, a faculty which he indulged to the full in his holidays—spent largely in France or his native county, Northumberland. After his retirement he took up and acquired considerable technical skill in oil painting. He was also a collector of English water-colour drawings, old flower pieces, and illustrated herbals.

In 1860 the Chair of Botany was what would now be called a part-time appointment. The main duty was the delivery of a course of fifty lectures on General Botany to medical students (chiefly) during the summer session. Beyond this duty, supplemented by a few practical demonstrations in microscopical botany, the presence of the Professor was not required at the College.

In view of Oliver's work at Kew, it was desirable that his course should be held (as in the case of his predecessor Lindley) either at the beginning or end of the day. His proposal to adopt Lindley's hour of 4 p.m. was frustrated by Potter (Professor of Natural Philosophy), who took the opportunity of a change in the chair to annex this hour for his own purposes. Under the circumstances the hour of 8 a.m was fixed on for Botany, and this was retained till his retirement in 1888. Oliver lived at Kew in an official residence adjacent to the Gardens. In those days the only railway station serving Kew was Kew Bridge, and no train was early enough for the purposes of the 8 o'clock lecture. He was aroused each morning at 5 a.m. by the Gardens night-constable rapping on the bedroom window with a pole till an answering hand appeared—varied on Fridays by the hand releasing an agreed gratuity of 2s. 6d. for the week's service. This routine remained unbroken for twenty-eight years. At 6 a.m a cab rumbled away with the

Professor to Hammersmith, where the journey to Gower Street was completed on the Metropolitan Railway. The long interval between his arrival at the College and the beginning of the lecture was occupied in the distribution of specimens at each student's place; every day six specimens were dealt with, a quarter of an hour being taken from the lecture for this purpose. In this way some three hundred living specimens came under the direct notice of the class: a very high collective efficiency in Systematic Botany was the result. Students of those days frequently refer with grateful appreciation to the value of the discipline thus acquired. The following is an extract from a letter written by Sir Rickman Godlee very shortly before his death. It gives in few words a vivid and convincing picture of Oliver and his class in 1868:

" I can see and smell the plants laid out on our desks, especially a noble artichoke which was quite new to me. My recollection of Daniel Oliver is that of a man rather below the middle height, who seemed to be on springs—moving quickly across the stage and suddenly appearing amongst us in distant parts of the theatre. A very clear but rapid staccato delivery. I was very keen about Botany, and thoroughly enjoyed his lectures, but Botany was a bugbear for most medical students. They could not see the use or fun of it. Barlow* was another devotee. He had the peculiarity of wearing a suit of dittos—light grey—and a grey wideawake, which were quite exceptional in those days of black coats, top-hats, and budding moustaches, whiskers or beards, or whatever down we could grow."

Shortly after his appointment Oliver encountered the great De Morgan, who asked him what textbook he advised his students to read. He replied that on the whole he was averse from books, and preferred that they should rely mainly upon the direct study of actual specimens. De Morgan's rather abrupt change of the subject was accounted for a few days later when Oliver, dipping into the College Calendar, found prominence given to the following passage in the prospectus of the Department of Mathematics: "The Professor reminds all who enter his class that nothing can be more erroneous than the impression that much can be done by merely attending the lectures. Unless such attendance be accompanied by regular study of the books recommended . . . he cannot guarantee, etc."

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* Sir Thomas Barlow, Bt., who became President of the Royal College of Physicians. He obtained a gold medal in Botany, 1868, whilst Godlee was awarded the 5th certificate. The latter, however, qualified for the Exhibition in Botany at the Prelim. Sci. Examination at the University.

The true explanation of De Morgan's enquiry was doubtless the fact that his son Edward (as the records show) was proposing to attend the class of Botany in the spring of 1861. He afterwards qualified as a medical practitioner.

Notwithstanding this bad beginning, three years later Oliver wrote his well-known *Elementary Lessons in Botany*, a book of which successive editions appeared for fifty years, and which, including an edition modified for Indian requirements, must have enjoyed a circulation close on 70,000 copies.

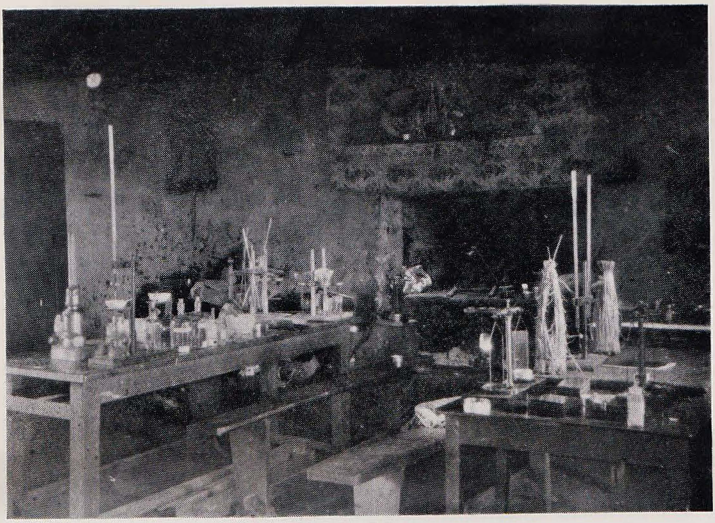
It was not till the year 1880 (when the University of London imposed a practical test at the various examinations) that Botany developed into a laboratory subject. The direction of these practical classes was entrusted to F. O. Bower, who afterwards held the Professorship of Botany in the University of Glasgow for forty years. Besides the elementary course, a small advanced class met this year in a room lent by Ray Lankester. Sir Sidney Harmer, late Director of the Natural History Museum, was one of those attending. The long room that had been taken from the cloister at the medical end and formerly used, under the name of " Microscope Room," for practical histology, was allocated to Botany and remained a botanical laboratory for thirty years (Pl. ii).

Bower was succeeded by D. H. Scott in 1882. It is recorded that Scott (reputed to be shy in those days), being in some trepidation about the interview which Oliver had requested at Kew, consulted his friend and supporter Vines (then at Cambridge) on the matter of suitable procedure; Vines answered, " Oh, that's quite simple, you just go up to his room at the Herbarium and say, 'Please, sir, I am the young man without encumbrances.' " Scott, in addition to having charge of the practical classes (elementary and advanced), gave advanced lectures during the winter. This arrangement continued till 1885, when Scott was appointed Assistant Professor in Botany under Huxley at the Royal College of Science.

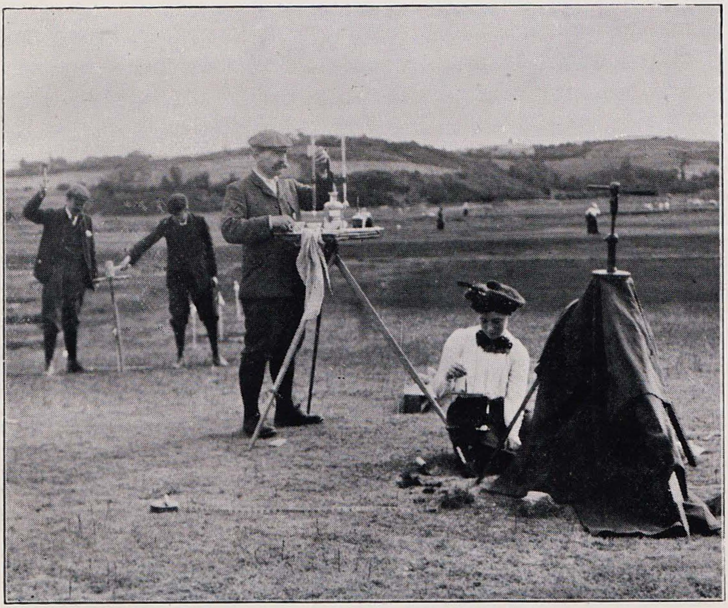
In 1888 Daniel Oliver resigned the chair and was succeeded by his son, F. W. OLIVER—an occurrence perhaps unique in the history of the College. The Council, it may be, uncertain of the wisdom of this step, made the appointment as Lecturer for a probationary period of two years, but the full professorship was granted in 1890. The Quain bequest received about this time enabled the Council to attach an endowment to the chair, which became a full-time appointment.

With the establishment of practical classes in the College about 1880, a new era began. A botanical outlet was at once created. Other colleges and universities were proceeding on similar lines, and so also the schools—thus a need of trained teachers and investigators gradually arose. The numbers of students, especially in the advanced classes, continuing to rise, the need of further accommodation became rather urgent. The idea occurred to young Oliver that the necessary extension could be obtained by the construction of side galleries in the spacious Museum of Anatomy (now the Science Library),

Plate III



INTERIOR OF OLD FARM BUILDING ON THE ERQUY MARSH USED AS A LABORATORY, 1905-1909



IMPROVISED FIELD LABORATORY FOR SOIL INVESTIGATIONS, BOUCHE D'ERQUY, 1904

The workers (from left to right) are: E. A. N. Arber, W. C. Wordsell, F. F. Blackman, and (at the "balance room") Miss Frances Chick and in conjunction with Roger Smith (Professor of Architecture) the plans were drawn out and the proposal referred to the Council for consideration. At this time Sir John Erichsen, the eminent surgeon and anatomist, was President of the College, and in due course he requested young Oliver to call at his house and talk the matter over. Sir John opened the interview with the words: " Mr. Oliver, you are a very young man and not the only Professor in the College," from which inauspicious beginning it was evident that Sir John had no intention of permitting an encroachment on the anatomical sanctum at the hands of Botany. But a way out was shortly discovered. Professor Chas. Graham, the chemist, lent a sympathetic ear, and in resigning about this time his chair of Applied Chemistry (which was not to be filled again) handled the matter so tactfully that a large portion of his laboratory (and ultimately the whole of it) passed to Botany. As this laboratory (the Birkbeck building) stood in the area just behind the old " Microscope Room," the two together formed a convenient and self-contained, if narrow, home for the department till its migration in 1909 to the old Physiological Department (vacated by Prof. Starling) on the top floor of the Slade wing. On the roof of the Birkbeck building a greenhouse was erected, and this, contrary to what might have been anticipated from the high buildings surrounding it, rendered excellent service during twenty years, both for the cultivation of plants and for experimental work.

The lectures of the department from 1888 till 1909 were given in the room now converted into the College Office. The old Botanical Theatre (which still retains its name) ceased to have any active connection with the department as long ago as 1888. It was, especially before it was remodelled, acoustically unsatisfactory and difficult to lecture in. The migration in 1909 to the old Physiological Department was made the occasion of a house-warming, at which many botanists were present, Dr. D. H. Scott delivering an address and opening the laboratories. The accommodation, though infinitely superior to that which preceded it, is now found to be cramped and inadequate.

SPECIAL COURSES

Shortly after young Oliver's appointment a new feature was introduced, the giving of short special courses (often by outside botanists) on recent advances on the subject on lines of research or in ideas. At first these were given by invitation of the Professor, as in the cases of the late Professor Marshall Ward (on his fungal work) and Dr. D. H. Scott (Studies in Fossil Botany). A few years previously Dr. Scott had been tempted by the late Prof. W. C. Williamson of Manchester (then an old man) to collaborate with him in the reinvestigation of a number of his fossil types from the British Coal Measures, and this course of lectures, which afterwards took shape in the well-known book under the same title, at once established fossil botany as a science, and also attracted many workers into that field. At the beginning of the present century courses on these lines were arranged under the reformed University of London, and many of these were, and continue to be, held at University College. Among them may be mentioned A. G. Tansley's "Evolution of the Filicinean Vascular System" (1898); F. F. Blackman's "Carbon Assimilation"; F. W. Oliver's "Origin of Gymnosperms," embodying the, at that time, recent discoveries on fossil seeds and making known the existence of a large and important group of fossil plants, the Pteridosperms, which had previously been confounded with the ferns. At a later date (1914) new ground was broken in a course on Maritime Plants, based on collective work done at Erquy (Brittany) and Blakeney Point

(Norfolk) by members of the department. Certain aspects of this were published, in conjunction with the late A. E. Cary, a maritime engineer, in *Tidal Lands* (1918), the object of which was to show the value of plants as agents in sea defence and reclamation. Another course, on the History of Botany, dealt with the work of British botanists from Ray and Hales to the Hookers and Marshall Ward in recent times. This course, delivered by a large number of botanists, was published under the title of *Makers of British Botany*. Other courses included " The Art of Illustration and Reproductive Processes," by T. G. Hill; " The Origin of Angiosperms," by the late Miss Ethel Sargant; " The Botany of the Herbals," by Dr. Agnes Arber; " The Exploitation of Plants," by members of the Department and others; " The Soil," by Sir John Russell and his colleagues at the Rothamsted Station. All of these courses formed the basis of subsequent publication.

THE QUAIN STUDENTSHIP

After the endowment of the Chair under the Quain Trust, a Quain studentship in Biology was founded in 1890. This studentship, always attached to Botany, has been held in succession by the following botanists: F. E. Weiss (now Professor of Botany in the University of Manchester); A. G. Tansley (now Sherardian Prof. of Botany in the University of Oxford); Edith Chick (now Mrs. A. G. Tansley); Agnes Robertson (now Dr. Agnes Arber); E. J. Salisbury (now Reader in Plant Ecology in the University of London); Sarah Baker (who died in 1917); V. S. Summerhayes (now on the staff of the Herbarium of the Royal Botanic Gardens, Kew); Violet Anderson, the present holder.

Dr. Sarah Baker was an enthusiast in the field of the brown seaweeds and in Physiology. In her memory the Sarah Baker Memorial Prize, attached to the Department of Botany, was founded by her family, and this was supplemented later by a generous grant from the Ellen Richards Committee in the United States of America. At the time of her death Sarah Baker had submitted a thesis for the Ellen Richards research prize, which thesis was highly esteemed by the referees, though no decision as to the award had been reached at her death.

LINES OF WORK

With the establishment of Botany in the College as a full-time subject with laboratories and other facilities, full courses for advanced and post graduate students were instituted, whilst researches were pursued in various fields. With the progress of the subject, changing fashions in research, and individual preferences, the centre of interest moved gradually from one field to another.

In the eighties and nineties it was especially morphology and anatomy, later anatomy from an evolutionary point of view. This led on to palæobotany, whilst in the early years of the present century there came a definite trend towards ecology and physiology.

MORPHOLOGY AND ANATOMY

Among a number of publications of the nature of morphological monographs may be mentioned Dr. Margaret Benson's investigations into the Amentiferæ with their peculiar ovular organisation and fertilisation. For several of these (birch, hornbeam, alder) she demonstrated that the course of the pollen tube was not as in ordinary angiosperms, via the micropyle, but as in Casuarina, via the chalaza. This work had a direct bearing on speculations then current and was a valuable contribution. In the same group may be mentioned monographs on Trapella, and on Sarcodes, by F. W. Oliver.

In *Anatomy* reference may be made to the work of A. G. Tansley and others, especially in tracing the

Plate IV

THE BLAKENEY POINT LABORATORY, BUILT 1913

THE OLD AND NEW LIFEBOAT HOUSES ON BLAKENEY POINT
The former is the headquarters for U. C. L. student parties

gradually increasing complexity of the vascular system in the Pteridophytes, work which culminated in Tansley's book already mentioned. Anatomy also found its uses in the discrimination of types of vascular arrangement in the seedlings of flowering plants, especially at the junction of root and stem. Primitive conditions were supposed to have persisted in this position. This particular field was explored by A. G. Tansley and Miss E. N. Thomas, and in another series of papers by T. G. Hill and the late Dr. Ethel de Fraine.

Palaeobotany.—The Coal Measures of Britain have long been famous for fossil plants, and especially for petrifactions with very perfect anatomical preservation. An early pioneer in the investigation of this field was Prof. W. C. Williamson, of Manchester, himself an old student of this College. As indicated above, the mantle of Williamson passed to D. H. Scott, who developed palaeobotany as a science and attracted many workers into this field. The Botanical Department here took a full share in this work, and in 1902 F. W. Oliver, in conjunction with D. H. Scott, was able to announce discoveries leading to the recognition of a large and important group of transitional fossils, to which the name of Pteridosperms was given. Further work in this field was done by E. J. Salisbury, Miss T. L. Prankerd, Dr. E. de Fraine, Miss N. Bancroft and Lady Isabel Browne, whilst Dr. Marie Stopes (afterwards Lecturer in Palaeobotany) visited Japan, where she collected mesozoic fossil petrifactions of great interest, and has contributed numerous memoirs on the plants of this horizon.

Another branch of Botany which for more than twenty years has received prominence in the work of the Department is Ecology. This deals especially with the relation of plants to their habitats and environment, and requires close study in the field. This meant camping for considerable periods in wild, unspoilt localities, the improvisation of field laboratories for physiological and other work, and the survey and study of an ever-changing vegetation. The pioneer expedition of this kind was to the Norfolk Broads in 1903; followed (1904-1909) by a series of annual visits of a fortnight's duration to a Brittany salt marsh, the Bouche d'Erquy, whilst from 1910 to the present time the need has been met by the creation of a maritime ecological station on Blakeney Point, Norfolk, where parties of eighteen or twenty students could be entertained and allotted definite field tasks, whilst at the same time enjoying a natural life in the open air in a place of great natural interest and beauty. In this way, in twenty-four years, many hundreds of students have not merely enjoyed an experience they will never forget, but have also come face to face with the operations of Nature in its most dynamic form.

These expeditions being a new departure were regarded by some as a bold and risky innovation. In the early days crowds of parents and friends of the students were wont to assemble on the platform at Waterloo to see the St. Malo boat train depart; to-day these visits are of the accepted order of things.

The following note is from a contributor who, as a student, attended several of the Erquy visits:

" The thought of those first expeditions to the Bouche d'Erquy, which have now receded some twenty years into the past, brings to one's mind a coloured kaleidoscope of impressions, that shift and break and re-define themselves in a way that baffles translation into words. The one thing that is really clear is that it was an incredible piece of luck to have had one's introduction to team work in Botany in those enchanting surroundings, which were just of a nature to reveal their full magic only to those who spent, as we did, the whole day on the marsh, through every changing phase of tide and weather. None of us can ever forget the first glimpse of the Bouche from the Erquy road, nor the unbelievable gold of the Breton gorse, nor that mysterious little sailing boat that used to float up the river at full tide, riding out of the mist with all the charm of the unknown. The children of the Bouche, too, have left indelible vignettes upon one's memory. There was Auguste Tillion, who was inspired by our party with the ambition to learn English; I wonder where Auguste Tillion is now? And there was that little girl whose acquaintance I made one day when I was washing some slides and coverslips in the duck-pond close to the farm. She came and settled herself sociably beside me on a stone, holding a great earthenware jar like a Greek amphora. She proceeded to dip the jar into the turbid green water, and then to rub it in leisurely fashion with a handful of ancient straw; I gathered that this was intended as a cleansing process. As she chattered away, her talk brought home to one the tragedy underlying the beauty of the Bouche, for her father had been lost at sea, sharing the fate of so many Breton fishermen. She was very curious as to the why and wherefore of our expedition but she had her own theory ready—'Monsieur le professeur, il est pharmacien, n'est-ce pas?' And though I tried hard to explain that the object of the professor's herb-gathering was non-medical, she remained—though polite—entirely incredulous.

" It is against such a background as this that one recalls the essence of the expedition—the evening discussions, when, all bemused with sunshine and salt air, we tried to wrestle with such problems as the relation of the 'apple-green' to the 'crimson' *Salicornia*. One night, when we had all entangled ourselves in a mesh of conflicting hypotheses, and were growing hot in defence of our pet ideas, the air was cleared by the burst of laughter that greeted one eager speaker, who, trembling with excitement, triumphantly summed up his views in these words: 'Apple-green Salicornias can't be elementary species, *for if they are, why don't they*?'"

Similar facilities for intensive field studies in Botany are now available in many Universities, especially in America, where they are elaborately organised with instructional curricula, attendance at which counts as a contribution to graduation requirements. In our case the old free and easy system has been maintained; attendance is purely voluntary alike for staff and students, and everybody takes a share in some research or another. Up to the present time about thirty Blakeney Point publications, arising out of work done on the station, have appeared.

Many of them deal with the structure and succession of the maritime plant formations, one group in particular dealing with the changes which occur in process of time in sand dune soils—a line of investigation quite novel at the time, which was taken in hand by Dr. E. J. Salisbury. The same investigator has also advanced our knowledge of British woodlands and their soils, and also of the chalk.

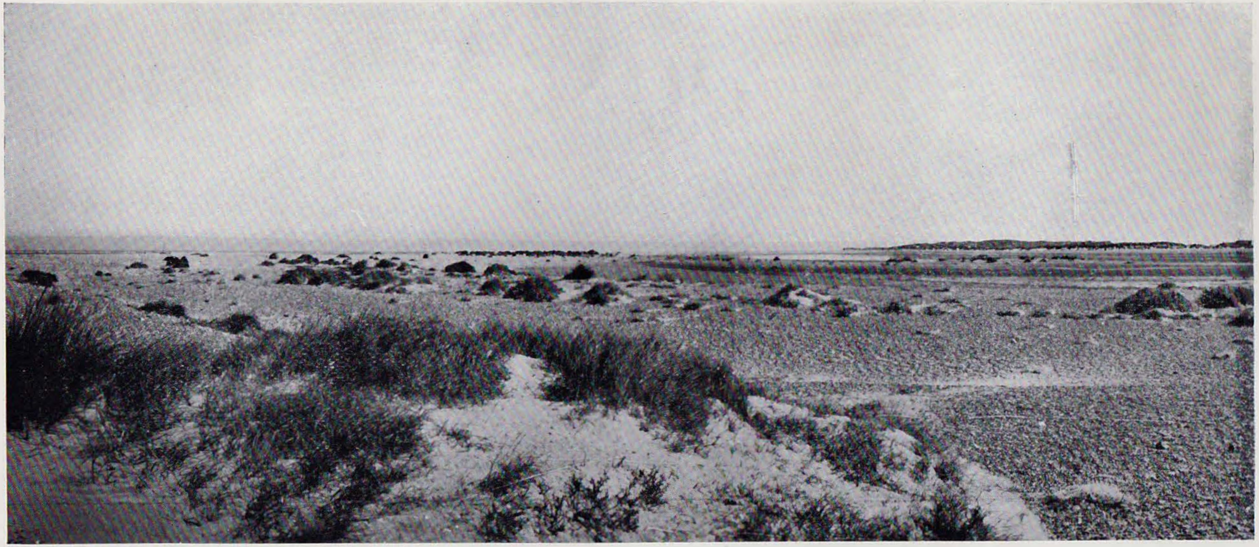
Associated with the Blakeney Point Station is a terns breeding ground, which in the earlier days provided much statistical and other material for investigation by William Rowan (now Professor of Zoology in the University of Alberta, Canada) and Prof. Karl Pearson of this College.

Under the heading of Ecology reference may also be made to Prof. F. E. Fritch's pioneer work (begun at University College) on the periodicity of Algae in their aquatic habitats—laborious compilations made with a view of correlating these phenomena with periodic changes in the surrounding factors.

PLANT CHEMISTRY AND PHYSIOLOGY.

During the War a demand arose for Irish Moss or Carrageen (a product of the seaweed *Chondrus crispus*) as a substitute for the inferior qualities of gelatine which were being supplied at that time to the military hospitals, and the organisation for the collection of quantities of this material by voluntary

Plate V



BLAKENEY FAR POINT (in 1926)
Of which the establishment and colonisation have been followed by the Botany Department

helpers and others was undertaken by the Department. In these circumstances it was not unnatural that one of the first subjects to be investigated in the Department of Plant Chemistry at its inception in 1920 was an examination of the physical and chemical properties of the so-called " Irish moss " mucilage. The extract as ordinarily prepared from the dried seaweed was shown to be a mixture of at least two substances which differed from each other in their colloidal and other properties, and in their chemical composition; an investigation of the ash content of these substances revealed the hitherto unsuspected fact that they were ethereal sulphates and, as such, they represented the first recorded examples of this type of combination in the plant world; the further observation that they were also colloidal electrolytes gave rise to an investigation of their physico-chemical properties from the point of view of the Donnan equilibrium which was undertaken in the Chemistry Department. Later it was shown that substances of similar nature occurred in a number of different marine algae, both red and brown.

The next investigation was one into the occurrence of nitrates in the plant world, as well as into the nitrate-reducing properties of certain plant materials; an attempt to correlate the latter property with the so-called Schardinger enzyme of milk led to an incursion into animal biochemistry involving the oxidising and reducing properties of milk.

A unique oxidising mechanism in the plant world was discovered in the course of an examination of the common Dog's Mercury (*Mercurialis perennis*). This plant was found to contain a peculiar reducing chromogen to which the name Hermidin was given; this substance absorbs atmospheric oxygen in two distinct stages without the intervention of an enzyme; the two stages are marked by definite colour changes which have been shown to be reversible. A detailed examination of this oxidising and reducing system from the point of view of its oxidation potential has been undertaken by the Department of Biochemistry and has yielded some valuable results and raised points of considerable theoretical interest.

In the above researches the lead was taken by Dr. T. G. Hill (Reader in Plant Physiology), and Dr. Paul Haas (Reader in Plant Chemistry), with the assistance of Miss B. Russell-Wells, Mr. L. S. Dorasami and others.

In addition to the above, though in no sense a speciality here, other matters affecting the *applied side of Botany* have from time to time been under investigation in the Department. Thus in 1890-1892 the effects of fog on urban vegetation, and especially on plants cultivated in greenhouses, was investigated experimentally.

In 1892 F. E. Weiss wrote a short monograph on the then new Chinese rubber plant, *Eucommia ulmoides* (" Tu chung "). This tree, besides producing its caoutchouc in elements anatomically quite distinct from the generality of rubber plants, has the further interest of being hardy in temperate climates. Hitherto this plant has not been exploited in Europe, though proposals for so doing have been made.

Arising out of the studies in maritime ecology, mentioned above, prolonged studies have been made in the Department into the circumstances of the occurrence and spread of *Spartina Townsendii*, a vigorous grass that originated in recent times on the mud flats of Southampton. This plant appeared spontaneously about fifty years ago, and is presumed to be a natural hybrid between an indigenous species and another, accidentally introduced from North America nearly a century ago. Whatever its origin this plant has spread everywhere on these muds and extended its range both East and West along the Channel coast. On the North coast of France the same thing is happening on even a greater scale. In all, an area of perhaps fifty square miles has been occupied up to the present time, and it is difficult to say where it will stop. Its qualities as an agent of reclamation are becoming widely recognised, and large consignments of *Spartina* roots have been shipped overseas to Australia, New Zealand, Holland, Germany, and elsewhere. In the British Isles numerous experimental plantations have been made by the owners of suitable foreshores, and touch is kept with its progress in these various localities. Apart from the mystery of its origin, perhaps the most remarkable characteristic of *Spartina* is the fact that the muds which it colonises must, until its appearance, have remained for long ages bare of vegetation, owing to the incapacity of any available salt marsh plant to invade and occupy them. Undoubtedly its apparition provides one of the most remarkable plant manifestations of historic times.

Attached to the Department is a vigorous Botanical Society under the students' own management. Founded in 1921, this Society supersedes for botanical purposes a much older and now defunct Biological Society which dated back nearly forty years.

PERSONNEL

Here follows a list of the personnel of the Department of Botany since the foundation of the College:

1st Professor, John Lindley, 1827-1860.

2nd Professor, Daniel Oliver, 1860-1888.

For one session in the early sixties Dr. Maxwell T. Masters deputised for Prof. D. Oliver during an illness.

About 1875 the Rev. George Henslow acted as Lecturer in Botany to women students.

In 1880 F. O. Bower, afterwards Professor of Botany in the University of Glasgow, acted as assistant in charge of the practical classes.

1881-1885, D. H. Scott started advanced classes.

1883-1888, C. A. Barber, A. C. Seward, F. E. Weiss and F. W. Oliver held assistantships.

In 1888 F. W. Oliver was appointed Quain Lecturer and in 1890 Quain Professor.

Since 1888 the following have occupied positions on the staff: F. E. Weiss, J. H. Salter, John Percival, W. B. Bottomley, W. C. Worsdell, A. G. Tansley, V. H. Blackman, Miss Edith Chick (Mrs. Tansley), F. E. Fritch, A. R. Stevens, T. G. Hill, Dr. Agnes Arber, E. M. Cutting, Dr. Ethel N. Thomas, E. J. Salisbury, Dr. Marie Stopes, Dr. Sarah Baker, Miss Winifred Smith, C. M. Green, Paul Haas, V. S. Summerhayes, Miss B. Russell-Wells, Miss V. L. Anderson, E. H. Chater, Miss G. L. Naylor. Mr. F. T. Smith has served as laboratory assistant since 1890.